AMENDMENT TO THE SPECIFICATION

Please replace the paragraph spanning lines 20-24 of page 15 with the following amended paragraph.

Figure 1C illustrates a block diagram of plan-view template generator 128 in accordance with one embodiment of the present invention. Plan-view template generator 128 comprises pattern extractor 170 and template processor [[180]]177. It should be appreciated that plan-view template generator 128 may be implemented within a computer system.

Please replace the paragraph spanning lines 11-26 of page 17 with the following amended paragraph.

With reference to Figure 1C, raw plan-view templates 175 are modified by template processor [[180]]177 to produce plan-view templates 125. It should be appreciated that template processor [[180]]177 is optional, and is not required for performing plan-view template generation 128. Template processor [[180]]177 may process raw plan-view templates 175 to produce new data representations embodied by plan-view templates 125. This processing may be include a combination of one or more of many types of data normalization and transformation, including but not limited to scaling in the spatial dimensions of the raw plan-view template, rotating the raw plan-view template image data, removal of small isolated regions of non-zero raw plan-view template data, smoothing of the raw plan-view template data, convolution of the raw plan-view template data with an image kernel, interpolation of the raw plan-view template data across small regions of zero or unreliable data, and representation of the raw plan-view template data in terms of contours, spatial moments, basis functions or vectors, or other primitives.

Please replace the paragraph spanning page 17, line 28 – page 29, line 12 with the following amended paragraph.

In some embodiments, template processor [[180]]177 applies height normalization to raw plan-view templates 175 containing height-related statistics. The height-related statistics may be of several types, including but not limited to a value representative of the height of one or more of the highest points in each bin, a value

representative of the height of one or more of the lowest points in each bin, the average height of the points in each bin, the median height of the points in each bin, or some combination thereof. In one embodiment, normalization of the height-related statistics of a given raw plan-view template 175 is accomplished by first ordering all of the values in the raw template, then selecting the value with rank order at some pre-determined percentile (e.g. 90%), and finally dividing all template values by this selected value to produce corresponding new values. In other embodiments, height normalization is accomplished by dividing all height-related statistical values by the maximum of all such values. In yet other embodiments, height normalization is accomplished by dividing all height-related statistical values by the average of all such values.

Please replace the paragraph spanning lines 14-30 of page 18 with the following amended paragraph.

In some embodiments, template processor [[180]]177 transforms the raw template data into a representation based at least in part on a vector basis. Given a set of N basis vectors for the plan-view templates, a particular plan-view template, with M data elements, is transformed by this basis by computing the dot product of the plan-view template with each of the N basis vectors, each of which also has M data elements, to produce N scalar coefficients. The set of N scalar coefficients forms a new representation of the plan-view template. This transformation may occur before or after other processing steps, such as height normalization, performed by template processor [[180]]177. In practice, N is selected to be less than M, so that although this new representation of the data is not as complete as the original, it may capture significant or interesting features of the input data in a more compact form that allows for faster and/or easier processing in subsequent computations. In some embodiments, each plan-view template 125 is comprised of N scalar coefficients in combination with normalizing factors and/or other factors obtained in other processing steps, such as height normalization, performed by template processor [[180]]177.

Please replace the paragraph spanning lines 1-23 of page 19 with the following amended paragraph.

A suitable vector basis for the above-described transformation is obtained through principal component analysis (PCA) of plan-view templates in some embodiments of the invention. It should be appreciated that PCA is well understood in

the field of image processing. In brief, PCA transformation of data begins with creation of a set of basis vectors from a set of training data. To accomplish this, each member of the set of training data is treated as a point in the space of all possible data of this kind. For the purposes of this invention, the training data is raw plan-view templates, and each is treated as a point in a space that has dimensionality equal to the number M of pixels in a plan-view template. PCA computes a mean vector of the points in this space, subtracts this mean from all of the points, and then computes the eigenvalues and eigenvectors associated with the mean-shifted points. The eigenvectors associated with some number N of the largest eigenvalues are selected as the PCA basis vectors. Given a set of N PCA basis vectors for the plan-view templates, a particular plan-view template is transformed by this basis by first subtracting the mean vector from it, and then computing the dot product of the plan-view template with each of the N PCA basis vector to produce N scalar coefficients. The set of N scalar coefficients forms a new representation of the plan-view template. In one embodiment, template processor [[180]]177performs height normalization followed by transformation with a vector basis obtained through PCA on plan-view templates, to produce a new plan-view template representation comprising the N scalar coefficients and one normalizing height factor.